SECTION 1 - GENERAL

1.1 PURPOSE

1.1.1 The aim of this manual is to promote uniformity of implementation of the technical procedures of Annex 16, Volume 1, and to provide guidance such that all certificating authorities can apply the same degree of stringency and the same criteria for acceptance in approving applications for the use of equivalent procedures.

1.1.2 This manual provides guidance in the wider application of equivalent procedures that have been accepted as a technical means for demonstrating compliance with the noise certification requirements of Annex 16, Volume 1. Such procedures are referred to in Annex 16, Volume 1, but are not dealt with in the same detail as in the Appendices to the Annex which describe the noise evaluation methods for compliance with the relevant Chapters.

1.1.3 Annex 16, Volume 1, procedures must be used unless an equivalent procedure is approved by the certificating authority. Equivalent procedures should not be considered as limited only to those described herein, as this manual will be expanded as new procedures are developed.

1.1.4 For the purposes of this manual an equivalent procedure is a test or analysis procedure which, while differing from one specified in Annex 16, Volume 1, in the technical judgement of the certificating authority, yields effectively the same noise levels, within 0.3 dB, as the specified procedure.

1.1.5 References to Annex 16, Volume 1, relate to the Amendment ~~5~~6 thereof.

1.2 FRAMEWORK

Equivalent procedures fall into two broad categories; those which are generally applicable and those which are applicable to a particular aircraft type. For example, some equivalencies dealing with measurement equipment may be used for all types of aircraft, but a given test procedure may only be appropriate for turbojet powered aeroplanes, and not to turboprop powered aeroplanes. Consequently this manual is framed to provide information on equivalent procedures applicable to the types of aircraft covered by Annex 16, Volume 1, ie. jet powered, propeller driven heavy and light aeroplanes and helicopters. Equivalent procedures applicable to each aircraft type are identified in separate sections. Each section covers, in the main, flight test equivalencies, the use of analytical procedures and equivalencies in evaluation procedures.

1.3 INCORPORATION OF EQUIVALENT PROCEDURES INTO THE NOISE COMPLIANCE DEMONSTRATION PLAN

1.3.1 Prior to undertaking a noise certification demonstration, the applicant is normally required to submit to the certificating authority a noise compliance demonstration plan. This plan contains the method by which the applicant proposes to show compliance with the noise certification requirements. Approval of this plan and the proposed use of any equivalent procedure remains with the certificating authority. The procedures in this manual are grouped for specific applications. The determination of equivalency for any procedure or group of procedures must be based upon the consideration of all pertinent facts relating to the application for a certificate.

1.3.2 Use of equivalent procedures may be requested by certificate applicants for many reasons, such as:

a) to make use of previously acquired certification test data for the aeroplane type;

b) to permit and encourage more reliable demonstration of small noise level differences among derived versions of an aeroplane type; and

c) to minimise the costs of demonstrating compliance with the requirements of Annex 16, Volume 1, by keeping aircraft test time, airfield usage, and equipment and personnel costs to a minimum.

1.3.3 The material included in this manual is for technical guidance only. The use of past examples of approved equivalencies does not imply that these equivalencies are the only acceptable ones, neither does their presentation imply any form of limitation of their application, nor does it imply commitment to further use of these equivalencies.

1.4 CHANGES TO THE NOISE CERTIFICATION LEVELS FOR DERIVED VERSIONS

1.4.1 Many of the equivalent procedures given in this manual relate to derived versions, where the procedure used yields the information needed to obtain the noise certification levels of the derived version by adjustment of the noise levels of the "flight datum" aircraft (ie. the most appropriate aircraft for which the noise levels were measured during an approved Annex 16, Volume 1, flight test demonstration).

1.4.2 The physical differences between the "flight datum" aircraft and the derived version can take many forms, for example, an increased take-off weight, an increased engine thrust, changes to the powerplant or propeller or rotor types, etc. Some of these will alter the distance between the aircraft and the noise certification reference points, others the noise source characteristics. Procedures used in the determination of the noise certification levels of the derived versions will therefore depend upon the change to the aircraft being considered. However, where several similar changes are being made, for example, introduction of engines from different manufacturers, the procedures used to obtain the noise certification levels of each derivative aircraft should be followed in identical fashion.

1.4.3 Care should be taken to ensure that the cumulative effect of small changes that would individually increase noise levels by less than 0.3 dB but would, taken together, increase noise levels by greater than this, are taken into account by referring the additive effects of each change to the noise certification level determined by a procedure approved by the certificating authority.